

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Krishna Kishore Yellepeddy, Lok Yan Leung, Anthony Joseph Nadalin

Assignee: International Business Machines Corporation

Title: Dynamic PKI Architecture

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Examiner: Carl G. Colin Group Art Unit: 2136

Docket No.: AUS920000947US1 Customer No. 65362

Austin, Texas
January 28, 2008

COMMISSIONER FOR PATENTS
PO BOX 1450
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APPEAL BRIEF UNDER 37 CFR § 41.37

Dear Sir:

Applicants submit this Appeal Brief pursuant to the Notice of Appeal filed in this case on June 12, 2007. The fee for this Appeal Brief is being paid via the USPTO-EFS. The Board is also authorized to deduct any other amounts required for this appeal brief and to credit any amounts overpaid to Deposit Account No. 090447.

I. REAL PARTY IN INTEREST - 37 CFR § 41.37(c)(1)(i)

The real party in interest is the assignee, International Business Machines Incorporated as named in the caption above and as evidenced by the assignment set forth at Reel 011393, Frame 0086.

II. RELATED APPEALS AND INTERFERENCES - 37 CFR § 41.37(c)(1)(ii)

Based on information and belief, there are no appeals or interferences that could directly affect or be directly affected by or have a bearing on the decision by the Board of Patent Appeals and Interferences in the pending appeal. Pursuant to current Patent Office practice, Appendix "A" contains copies of all decisions rendered by a court or the Board in this "Related Appeals and Interferences" section, and is intentionally provided as an empty appendix.

III. STATUS OF CLAIMS - 37 CFR § 41.37(c)(1)(iii)

Claims 1-50 are pending in the application. Claims 1-50 stand rejected. The rejection of claims 1-50 is appealed. Appendix “B” contains the full set of pending claims.

IV. STATUS OF AMENDMENTS - 37 CFR § 41.37(c)(1)(iv)

On January 10, 2005, Applicants filed a Response to Office Action Under 37 C.F.R. § 1.111 amending claims 1, 13, 24, and 33, and adding missing claim 8. On January 8, 2007, Applicants filed an Amendment and Response to Final Office Action which amended the specification (paragraphs 71 and 92), drawings (Figures 3 and 4), and claims 2 and 25 to correct minor typographical errors. Finally, due to uncertainty on whether the foregoing amendments were entered, Applicants resubmitted the amendments to the claims, drawings and specification (including a new amendment to paragraph 65) in a Request For Reconsideration And Renewed Petition Under 37 CFR § 1.137(b) dated June 12, 2007. At this point, Applicants are still not certain which, if any, amendments were entered by the Advisory Action (dated May 1, 2007) or the subsequent Decision on Petition (dated November 27, 2007).

V. SUMMARY OF CLAIMED SUBJECT MATTER - 37 CFR § 41.37(c)(1)(v)

The claims of the present patent application are directed to a particular software architecture composed of functional building blocks of software or “beans” that respond to propagated events for implementing functionality related to digital certificates. Each of the independent claims 1, 13, 24, 35, and 44 introduces a requirement of at least one bean. The beans are linked together through propagating events. In one embodiment they are written in a real-time object oriented code, such as Java which provides an environment that allows for the immediate implementation of the beans across a wide variety of computing systems to operate in a system independent manner.

The subject matter defined in independent claim 1 may be understood with reference to the example embodiments depicted in Replacement

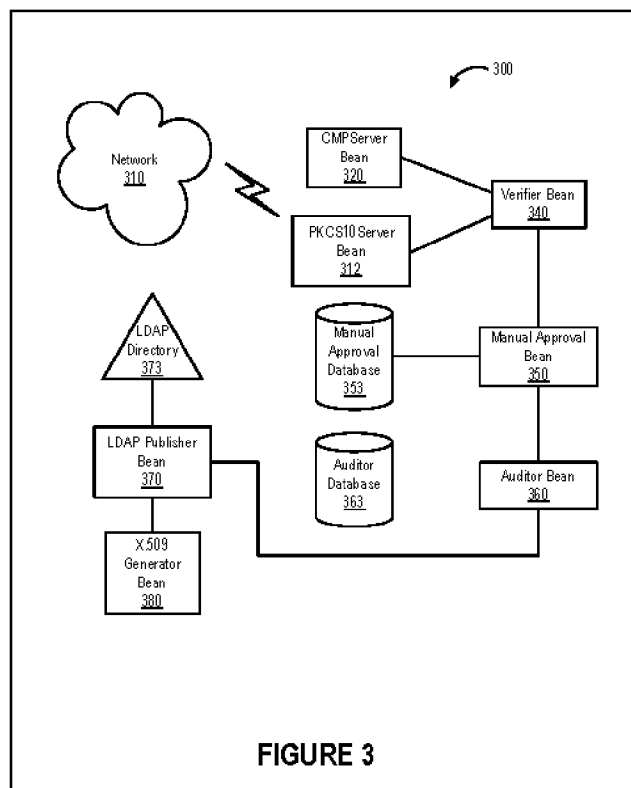


FIGURE 3

Figure 3 which depicts how the beans of the invention may be used in a distributed processing system to implement a request regarding a digital certificate (e.g., a PKI request for a certificate authority). As described and depicted, the PKI system 300 includes software written in real time executable object-oriented language, such as Java, and one or more beans. *See*, Application, pp. 5-6 (“Summary of the Invention”). When a request regarding the digital certificate is received (e.g., from the network 310), request implementation software (e.g., Java code) in the PKI system 300 implements a response thereto using at least one reception bean (e.g., the Certificate Management Protocol (CMP) server bean 320). As shown and described by Applicants, each of the beans is communicatively coupled to the request implementation software and the distributed processing system. In response, the reception bean (e.g., 320) generates an event object, such as by formatting the request for further processing by the PKI system 300. *See*, Application, p. 17, lines 15-22 (“FIG. 3 is a functional block diagram of how the beans of the invention may be implemented in the handling of a PKI request for a certificate authority. A request reaches the PKI system 300 through a connection to a network 310. A Certificate Management Protocol (CMP) server bean 320 receives a CMP request from the network 310. The CMP formatter bean formats the CMP request into a specific request to be sent to the remainder of the system 300.”)

To comply with 37 CFR § 41.37(c)(1)(v), a color-coded comparison of independent claim 1 (with reference numerals) and Figure 3 is set forth below:

1. An apparatus for implementing a request regarding a digital certificate in a distributed processing system, the apparatus comprising:

a request implementation software (300) that implements a response to the request regarding the digital certificate in response to a propagated event object;

at least one reception bean (e.g., 320), communicatively coupled to the request implementation software and the distributed processing system, that generates an event object in response to receiving the request to generate a digital certificate from the distributed processing system; and

the request implementation software instantiated in a real time executable object-oriented language.

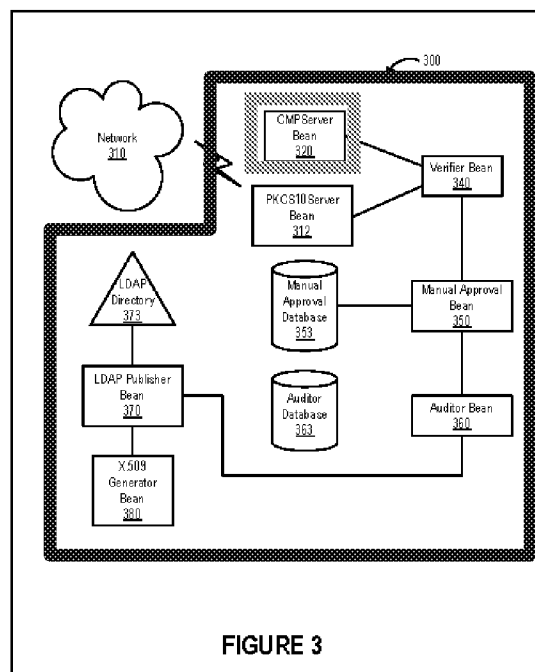


FIGURE 3

In further compliance with 37 CFR § 41.37(c)(1)(v), a color-coded comparison of selected Figures from the application and each of the pending independent claims is attached at Appendix “C” to provide a concise explanation of the subject matter defined in each independent claim. As will be appreciated, the color-coded comparison is provided to summarize the claimed subject matter by explaining how the claim language reads onto or overlaps with the exemplary disclosure from the application and drawings, and is not being provided to specifically define or limit the claim terminology to the specific example depicted. The subject matter of the independent claims is set forth in the specification at U.S. Patent Pub. No. 2002/0120841, ¶¶ 20-25, 28-35, 40, 45, 54-121, though additional contextual description is provided in the application.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL - 37 CFR § 41.37(c)(1)(vi)

In the Final Office Action dated April 21, 2005, the Examiner objected to certain informalities in Figures 3 and 4; rejected claims 35-39 and 41-43 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,751,735 to Schell et al.; rejected claims 1, 3, 4, 6-9, 12, 13, 15, 16, 18-20, 23, 24, 26, 27, 29-31, 34, 40 and 44-50 under 35 U.S.C. § 103(a) as obvious over Schell in view of Balfanz et al. “A Security Infrastructure for Distributed Java Applications,” 2000 IEEE Symposium on Security and Privacy (May 2000); and rejected the remaining pending claims under 35 U.S.C. § 103(a) as unpatentable over Schell in view of Balfanz (as applied to claims 1, 13, 24) and further in view of U.S. Publication No. 2001/0001877 to French et al. Applicants filed an Amendment after Final which submitted replacement drawings for Figures 3 and 4. In the Amendment after Final, Applicants also proposed to amend paragraphs 71 and 93 of the specification and to amend claims 2 and 25 to correct minor typographical errors. Unfortunately, Applicants are not able to discern whether the proposed amendments were entered. Accordingly, the grounds of rejection that are on appeal are:

- (A) The objections to Figures 3 and 4;
- (B) The anticipation rejection of claims 35-39 and 41-43 over Schell;
- (C) The obviousness rejection of claims 1, 3, 4, 6-9, 12, 13, 15, 16, 18-20, 23, 24, 26, 27, 29-31, 34, 40 and 44-50 over Schell and Balfanz; and
- (D) The obviousness rejection of claims 2, 5, 10, 11, 14, 17, 21, 22, 25, 28, 32 and 33 over Schell, Balfanz and French.

VII. ARGUMENT - 37 CFR § 41.37(c)(1)(vii)

As a preliminary matter, Applicants respectfully submit that the April 21, 2005 Office Action improperly entered a final rejection over the newly cited Schell, Balfanz and French references. None of these references was used in the first Office Action dated July 1, 2004. Instead, the first Office Action relied only on U.S. Patent No. 6,598,167 to Devine et al. to reject the claims as anticipated. Applicant overcame the rejection of the first Office Action by pointing to deficiencies in the rejection analysis, and included only minor changes to some of the claims in order to correct certain claim informalities noted by the Examiner. Indeed, most of the claims were not amended at all, so it was improper for the Examiner to finally reject the claims based on the assertion that “Applicant has changed the scope of the invention in view of the amended claims.” Final Office Action, p. 2 (April 15, 2005). Accordingly, Applicants request a full and fair consideration of the pending application and arguments presented herein.

A. Figures 3 and 4 Have Been Corrected To Overcome Objections As Required

In the Final Office Action, the Examiner objected to certain informalities in Figures 3 and 4.¹ In response to the objection to Figure 3, Applicants submitted a Replacement drawing sheet for Figure 3 to include reference numerals 300 and 312 in accordance with the originally submitted description, and in addition, amended the specification to change the reference numeral “330” in paragraph 71 to reference numeral “380” in accordance with the originally submitted Figure 3. *See, Amendment and Response to Final Office Action* (January 8, 2007). In further response, Applicants submit that the reference numeral “322” referenced by the Examiner was actually reference numeral 312 that refers to the block labeled “PKCS10Server Bean,” and the previously submitted correction should make this clear.

As for the objection to Figure 4, Applicants submitted a Replacement drawing sheet for Figure 4 to include reference numeral 400 in accordance with the originally submitted description, and also amended the specification at paragraph 93 to include a reference to numeral 446 which is depicted in Figure 4 as referring to an IfThenElse bean for a first certificate authority CA1. *See, Amendment and Response to Final Office Action* (January 8, 2007).

¹ It appears that the drawing objections were also included in the first non-final office action. In responding to the first office action, prior counsel for Applicants indicated that new drawings were being submitted separately. *See, Response to Office Action Under 37 C.F.R. § 1.111*, p. 18. However, the Patent Office records do not indicate that the drawings were received. Accordingly, the undersigned submitted new Figures 3 and 4 in response to the final office action.

In the Advisory Action Before the Filing of an Appeal Brief dated May 1, 2007, the Examiner indicated that the drawing amendments had been considered, but apparently was not satisfied with the amendment because, according to the Examiner, “the specification on page 17 lines 18 and 23, and 27 still recite the same reference 300 to designate both system and network.” In response, Applicants amended the specification at paragraph 65 to remove the reference to “network 300” and replace it with “network 310” in keeping with the Figure 3 disclosure. *See, Request For Reconsideration And Renewed Petition Under 37 CFR § 1.137(b)* (June 12, 2007). Because the foregoing amendments were submitted to comply with a requirement of form set forth in a previous office action, Applicants respectfully request that the amendments be entered, that the drawing objections be withdrawn and that the drawings be approved.

B. Claims 35-39 and 41-43 Are Not Anticipated by Schell

Applicants appeal the anticipation rejection of claims 35-39 and 41-43 because Schell’s disclosure of a certificate hierarchy protocol for use by separate entities does not anticipate the present invention’s scheme for using event-responsive software module building blocks to implement a public key infrastructure so that at least one module acts as a “pipe” to propagate an event to a plurality of the modules. *See, e.g., claim 35.* While the Examiner’s Advisory Action Before Filing of an Appeal Brief correctly notes that the claimed invention can be applied to separate entities, the other important differences between the claimed invention and Schell’s disclosure were not addressed or acknowledged.

In particular, the invention recited in claims 35-39 and 41-43 is directed to a particular software architecture comprising beans that respond to propagated events for implementing functionality related to public key infrastructure, including a pipe bean that propagates an event to other beans. However, the claim rejections completely ignore the specific language in the claims that recite these software architectural features. For example, the first element of independent claim 35 reads as follows:

a plurality of beans, the beans communicatively coupled to one another and responsive to events generated by the plurality of beans;

The rejection of independent claim 35 states that this feature is found in Schell at column 9, lines 9-30, and Figure 5-6. Final Office Action, p. 4. Applicants strongly disagree that Schell discloses the claimed features, since the cited disclosure from Schell refers only to a hierarchical

linking mechanism for limiting access to modules, and does not disclose or suggest that any particular module may respond to events generated by the plurality of modules.

The claim rejections also ignore the specifically recited requirements of the second element of independent claim 35, which reads as follows:

at least one of the plurality of beans comprising a pipe bean that propagates an event to another of the plurality of beans....

While Applicants have closely reviewed the passages (col. 19, lines 1-10 and 50-67) from Schell which the Examiner cites to show “a CMC signature root that propagates events to another of the plurality of the modules,” Applicants are simply not able to identify any disclosure in the cited Schell passages suggesting that the CMC signature root 152b is an event-responsive module (or bean) that propagates an event to a plurality of event-responsive modules or beans as claimed.

As a preliminary matter, Schell does not disclose using building block modules where each module responds to an “event” by performing a simple operation on an incoming request. And rather than describing event propagation from a pipe module (or bean) to a plurality of event-responsive modules (or beans), Schell discloses a conventional certificate scheme whereby separate entities are generating and verifying different certificates. Indeed, the passage cited by the Examiner states that “[a]ny subsequent entity, receiving a certificate 154 cascading from the CMC signature root 152b as a certifying authority, may verify the certificate 154.” Schell Patent, col. 19, lines 58-60. This is also confirmed by Schell Figure 5 – which is referenced by the passages cited by the Examiner -- which illustrates how separate entities (e.g., a certification authority 152a, certificate holders 152b, 152c, 152d, 152e) are used to implement a certificate hierarchy. In addition, Schell states that:

When discussing authorities, holders, receivers, and the like, it is important to realize that such an authority, holder, sender, receiver, or the like may actually be a hardware device, or a software operation being executed by a hardware device. Any hardware device, operating software, or data structure in a memory device may be owned, controlled, operated, or otherwise associated with an individual or an entity. Nevertheless, insofar as the invention is concerned, names of such entities may be used to represent the hardware, software, data structures, and the like controlled or otherwise associated with such entities.

Schell Patent, col. 15, lines 50-60. In this respect, Schell typifies the prior art with its description of the CMC Signature Root 152b as being a certification authority. *See*, Schell, col. 17, lines 59-67. In short, Schell in no way suggests Applicants’ invention for coupling individual software

module building blocks (or beans) that are responsive to particular events. Nor does Schell disclose that the recited plurality of beans includes an event-responsive pipe bean that propagates an event to other event-responsive modules (or beans) that take the event and perform some other operation in the defined process.

For at least the foregoing reasons, Applicants respectfully request reconsideration and withdrawal of the rejection because the Examiner has not made the *prima facie* anticipation showing that each and every element of the claimed invention, arranged as required by the claims, are found in the Schell reference, either expressly or under the principles of inherency. *See generally, In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986); Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984). For at least the foregoing reasons, Applicants respectfully request that the anticipation rejection of claims 35-39 and 41-43 be withdrawn and that the claims be allowed.

C. Claims 1, 3, 4, 6-9, 12, 13, 15, 16, 18-20, 23, 24, 26, 27, 29-31, 34, 40 and 44-50 Are Not Obvious Over Schell In View of Balfanz

Applicants appeal the obviousness rejection of claims 1, 3, 4, 6-9, 12, 13, 15, 16, 18-20, 23, 24, 26, 27, 29-31, 34, 40 and 44-50 because Schell's disclosure of a CMC signature root does not disclose or suggest the requirement of a reception module (or bean) that generates an event object (or reception event object) in response to receiving a request to generate a digital certificate as recited in these claims (by virtue of their respective recited dependencies), and Balfanz does not remedy this deficiency.

In particular, the invention recited in independent claims 1, 13 and 24 (and the associated dependent claims) is directed to a particular software architecture for implementing functionality relating to digital certificates by using a reception bean that responds to a request to generate a digital certificate from the distributed processing system by generating a reception event object that is propagated to request implementation software. However, the claim rejections completely ignore the specific language in the claims that recite these software architectural features. For example, the second element of amended claim 1 reads as follows:

at least one reception bean, communicatively coupled to the request implementation software and the distributed processing system, that generates an event object in response to receiving the request to generate a digital certificate from the distributed processing system.

The rejection of independent claims 1, 13 and 24 states that the recited “reception bean” feature is found in Schell at column 19, lines 51-57. Final Office Action, pp. 7, 8. Applicants strongly disagree that Schell discloses the claimed features, since the cited disclosure from Schell refers only to an authorization scheme whereby the CMC signature root 152b is a *separate entity* who is a certificate holder having limited authorization to create private/public key pairs, and does not disclose or suggest that any particular reception module that generates an event object in response to a request to generate a digital certificate. Thus, rather than disclosing the use of building block modules (or beans) that respond to a request to generate a digital certificate by generating an event object (as variously recited in claims 1-34), Schell instead describes a conventional certification scheme whereby a distinct authority entity (e.g., CMC Signature Root 152b) certifies or provides a signing operation (e.g., 166d) for a certificate (e.g., 154d) for a separate holder entity (e.g., 152d). *See*, Schell Patent, col. 18, line 66 to col. 19, line 3. And rather than describing a reception module (or bean) that responds to an event generated by other modules (or beans) by performing a simple operation on the request (as variously recited in claims 40 and 44-50), Schell discloses a conventional certificate scheme whereby separate entities are generating and verifying different certificates. *See*, Schell Patent, col. 19, lines 58-60. Finally, Schell nowhere discloses coupling a plurality of modules (or beans) responsive to events that are generated by the plurality of modules (or beans) and that are subclassing from a base class event (as variously recited in claims 44-50).

The foregoing deficiencies in the Schell disclosure are not remedied by Balfanz,² which the Examiner cites only for the disclosure of the “object-oriented language” claim requirements. Since neither Schell nor Balfanz discloses or suggests a “reception bean” to generate event objects in response to a request to generate a digital certificate from the distributed processing system (as variously recited in claims 1-34) or a “plurality of beans” that are responsive to events generated by other beans (as variously recited in claims 35-50), Applicants need not address the Examiner’s improper use of hindsight reconstruction here or the lack of “motivation to combine” evidence since the combination of references does not meet the claim requirements, even if they were properly combined. Accordingly, Applicants respectfully request that the rejections of

² Applicants respectfully submit that the Balfanz disclosure does not qualify as prior art to the present invention, and hereby reserve the right to demonstrate prior conception and diligent reduction to practice to predate the presumptive May 2000 publication date of the Balfanz article.

claims 1, 3, 4, 6-9, 12, 13, 15, 16, 18-20, 23, 24, 26, 27, 29-31, 34, 40 and 44-50 be withdrawn and that the claims be allowed.

D. Claims 2, 5, 10, 11, 14, 17, 21, 22, 25, 28, 32 and 33 Are Not Obvious Over Schell In View of Balfanz and French

Applicants appeal the obviousness rejection of claims 2, 5, 10, 11, 14, 17, 21, 22, 25, 28, 32 and 33 over Schell in view of Balfanz and French because none of the references, alone or in combination, discloses or suggests a “reception bean” to generate event objects in response to a request to generate a digital certificate from the distributed processing system (as variously recited in claims 1-34) or a “plurality of beans” that are responsive to events generated by other beans (as variously recited in claims 35-50), as discussed hereinabove. To the extent that the additional requirements of dependent claims 2, 5, 10, 11, 14, 17, 21, 22, 25, 28, 32 and 33 are admitted to be missing from the disclosures of Schell and Balfanz, and are only remedied by the selective combination of the Schell, Balfanz and French references, Applicants submit that the Examiner has engaged in improper hindsight reconstruction by using the Applicants’ invention to selectively pick and choose from the cited art.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Where a rejection is based on the assertion that all claim limitations are found in a number of prior art references, the fact finder must determine “[w]hat the prior art teaches, whether it teaches away from the claimed invention, and whether it motivates a combination of teachings from different references.” In re Fulton, 391 F.3d 1195, 1199-1200 (Fed. Cir. 2004). The motivation-to-combine inquiry “prevent[s] statutorily proscribed hindsight reasoning when determining the obviousness of an invention.” Alza Corp. v. Mylan Labs., Inc., No. 06-1019 (Fed. Cir. Sept. 6, 2006). Thus, in the absence of any *explicit* suggestion in the Schell, Balfanz and French references that they should be combined, the Examiner must show that an *implicit* suggestion to combine these references may be found in the “common knowledge, the prior art as a whole, or the nature of the problem itself.” Dystar Textilfarben GMBH v. C.H. Patrick Co., No. 06-1088, pp. 7-8 (Fed. Cir. 2006). When a motivation to combine is not explicitly taught by the prior art references, the “evidence” of motive may be provided as an explanation of the well-known principle or problem-solving strategy to be applied, but in any event *requires* some evidence of any common knowledge and common sense, above and beyond mere assumption. Id., pp. 17-20.

As a preliminary matter, a *prima facie* case of obviousness has not been established since none of the cited references discloses using one or more “beans” that respond to an “event” or a “request to generate a digital certificate.” As for the additional requirements recited in dependent claims 2, 5, 10, 11, 14, 17, 21, 22, 25, 28, 32 and 33 that the Examiner concedes are missing from Schell and Balfanz, the Examiner invokes French to meet the missing requirements. Final Office Action, pp. 12-14. However, in the absence of any proper evidence that persons skilled in the art would be motivated to combine the references, this appears to be a textbook example of hindsight reconstruction. Obviousness cannot be established by hindsight combination to produce the claimed invention. In re Gorman, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). In short, the Examiner has not made a *prima facie* case that the combination of Schell, Balfanz and French were suggested by the prior art, common knowledge, or the nature of the problem, viewed through the eyes of an ordinary artisan, but has instead improperly relied upon Applicants’ disclosure to reconstruct the prior art. Accordingly, Applicants respectfully request that the obviousness rejection of claims 2, 5, 10, 11, 14, 17, 21, 22, 25, 28, 32 and 33 be withdrawn and that the claims be allowed.

VIII. CLAIMS APPENDIX - 37 CFR § 41.37(c)(1)(viii)

A copy of the pending claims involved in the appeal is attached as Appendix “B.”

IX. EVIDENCE APPENDIX - 37 CFR § 41.37(c)(1)(ix)

None.

X. RELATED PROCEEDINGS APPENDIX - 37 CFR § 41.37(c)(1)(x)

There are no related proceedings.

XI. CONCLUSION

A prima facie case of anticipation and obviousness has not been established because none of the cited references discloses Applicant's disclosed use of beans that respond to propagated events by generating event objects to implement functionality related to digital certificates. Accordingly, Applicants respectfully submit that rejections of pending claims 1-50 should not be sustained, and request that the pending rejections be reversed.

FILED ELECTRONICALLY
January 28, 2008

Respectfully submitted,

/Michael Rocco Cannatti/

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Reg. No. 34,791

APPENDIX A - RELATED APPEALS AND INTERFERENCES

There are no decisions rendered by a court or the Board in any related proceeding.

APPENDIX B

1. An apparatus for implementing a request regarding a digital certificate in a distributed processing system, the apparatus comprising:
 - a request implementation software that implements a response to the request regarding the digital certificate in response to a propagated event object;
 - at least one reception bean, communicatively coupled to the request implementation software and the distributed processing system, that generates an event object in response to receiving the request to generate a digital certificate from the distributed processing system; and
 - the request implementation software instantiated in a real time executable object-oriented language.
2. The apparatus of claim 1, the at least one reception bean comprising a plurality of reception beans, and each of the plurality of reception beans generating an event in response to requests of differing formats.
3. The apparatus of claim 1, the request implementation software comprising at least one bean.
4. The apparatus of claim 3, the at least one bean comprising a pipe bean.
5. The apparatus of claim 3, the at least one bean comprising a bean implementing a test on the request.
6. The apparatus of claim 3, the at least one bean comprising a bean that alters the request.
7. The apparatus of claim 3, the at least one bean comprising a bean that publishes information regarding the request.
8. The apparatus of claim 3, comprising at least one sink bean and at least one pipe bean.

9. The apparatus of claim 3, the at least one bean comprising a sink bean.
10. The apparatus of claim 3, the at least one bean comprising a client bean that propagates a request in a first format.
11. The apparatus of claim 10, the at least one bean comprising another client bean that propagates a request in a second format.
12. The apparatus of claim 3, the certificate generation software comprising a legacy software.
13. A method for implementing a request regarding a digital certificate in a distributed processing system, the method comprising:
 - receiving the request to generate the digital certificate from the distributed processing system in an at least one reception bean;
 - generating a reception event object in response to step of receiving; propagating the reception event object;
 - selectively implementing a response to the request regarding the digital certificate in response to a propagated event object in a request implementation software;
 - the request implementation software instantiated in a real time executable object-oriented language.
14. The method of claim 13, the step of receiving comprising: receiving requests in differing formats; and the step of generating further comprising generating reception events in response to each request received.
15. The method of claim 13, the request implementation software comprising at least one bean.
16. The method of claim 15, the at least one bean comprising a pipe bean.

17. The method of claim 15, the step of selectively implementing comprising testing a parameter of the request.

18. The method of claim 15, the step of selectively implementing comprising altering a parameter of the request.

19. The method of claim 15, the step of selectively implementing comprising publishing information regarding the request.

20. The method of claim 15, the at least one bean comprising a sink bean.

21. The method of claim 15, the step of selectively implementing comprising propagating a request in a first format.

22. The method of claim 21, the step of selectively implementing comprising propagating a request in a second format.

23. The method of claim 15, the certificate generation software comprising a legacy software.

24. A computer program product on a computer usable medium, the computer usable medium having a computer usable program embodied therein for implementing a request regarding a digital certificate on a distributed data processing system, the computer usable program including:

instructions for receiving the request to regarding the digital certificate from the distributed processing system, the instructions for receiving instantiated in an at least one reception bean;

instructions for generating a reception event object in response to the instructions for receiving; instructions for propagating the reception event object;

instructions for selectively implementing a response to the request regarding the digital certificate in response to a propagated event object, the instructions for selectively implementing instantiated in a request implementation software; and

the instructions for receiving the request instantiated in a real time executable object-oriented language.

25. The computer program product of claim 24, the at least one reception bean comprising a plurality of reception beans, and each of the plurality of reception beans generating an event in response to requests of differing formats.

26. The computer program product of claim 24, the request implementation software comprising at least one bean.

27. The computer program product of claim 24, the at least one bean comprising a pipe bean.

28. The computer program product of claim 24, the at least one bean comprising a bean implementing a test on the request.

29. The computer program product of claim 24, the at least one bean comprising a bean that alters the request.

30. The computer program product of claim 24, the at least one bean comprising a bean that publishes information regarding the request.

31. The computer program product of claim 24, the at least one bean comprising a sink bean.

32. The computer program product of claim 24, the at least one bean comprising a client bean that propagates a request in a first format.

33. The computer program product of claim 24, the at least one bean comprising another client bean that propagates a request in a second format.

34. The computer program product of claim 24, the certificate generation software comprising a legacy software.

35. An apparatus for implementing a public key infrastructure in a distributed processing system, the apparatus comprising:

a plurality of beans, the beans communicatively coupled to one another and responsive to events generated by the plurality of beans; and

at least one of the plurality of beans comprising a pipe bean that propagates an event to another of the plurality of beans.

36. The apparatus of claim 35 further comprising a sink bean, the sink bean responsive to propagated events and consuming such propagated events.

37. The apparatus of claim 35 wherein the pipe bean passes the event to the another bean unaltered.

38. The apparatus of claim 35 wherein the pipe bean passes the event to the another bean in an altered format.

39. The apparatus of claim 35 further comprising a server bean, the server bean responsive to requests from the distributed processing system and generating events.

40. The apparatus of claim 35 further comprising a client bean, the client bean responsive to events from the other beans and generating requests to the distributed processing system.

41. The apparatus of claim 35 further comprising a generation bean, the generation bean generating a digital certificate in response to an event.

42. The apparatus of claim 35 further comprising a publisher bean, the publisher bean publishing information in response to an event.

43. The apparatus of claim 35 further comprising a filter bean, the filter bean filtering events based upon a predetermined criteria.

44. An apparatus for implementing a public key infrastructure in a distributed processing system, the apparatus comprising:

a plurality of beans, the beans communicatively coupled to one another and responsive to events generated by the plurality of beans; and

the respective events generated by the plurality of beans subclassing from a base class event.

45. The apparatus of claim 44 wherein the beans and events are written in a cross platform language.

46. The apparatus of claim 44 wherein the cross platform language is JAVA.

47. The apparatus of claim 44 wherein at least one of the beans is a publisher bean.

48. The apparatus of claim 44 wherein at least one of the beans is generator bean.

49. The apparatus of claim 44 wherein at least one of the beans is a server bean.

50. The apparatus of claim 44 wherein at least one of the beans is a client bean.

APPENDIX C

1. An apparatus for implementing a request regarding a digital certificate in a distributed processing system, the apparatus comprising:

a request implementation software (300) that implements a response to the request regarding the digital certificate in response to a propagated event object;

at least one reception bean (e.g., 320), communicatively coupled to the request implementation software and the distributed processing system, that generates an event object in response to receiving the request to generate a digital certificate from the distributed processing system; and

the request implementation software instantiated in a real time executable object-oriented language.

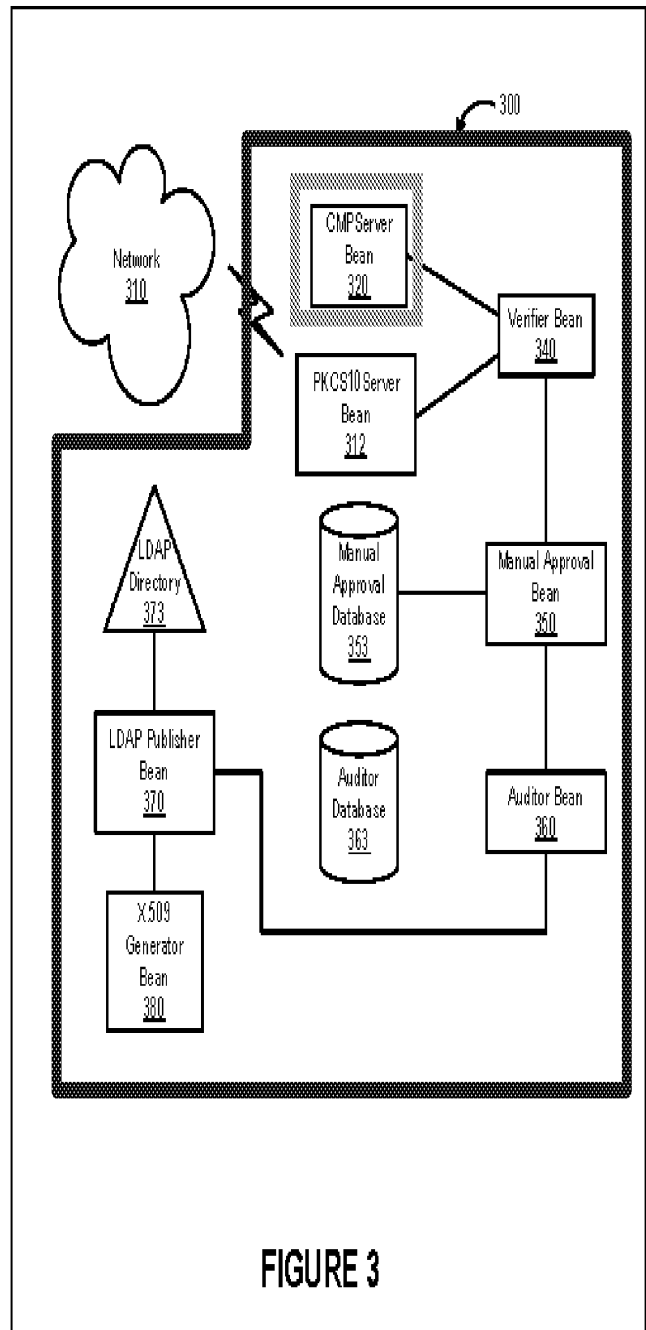


FIGURE 3

13. A method for implementing a request regarding a digital certificate in a distributed processing system, the method comprising:

receiving the request to generate the digital certificate from the distributed processing system in an at least one reception bean;

generating a reception event object in response to step of receiving;

propagating the reception event object;

selectively implementing a response to the request regarding the digital certificate in response to a propagated event object in a request implementation software;

the request implementation software instantiated in a real time executable object-oriented language.

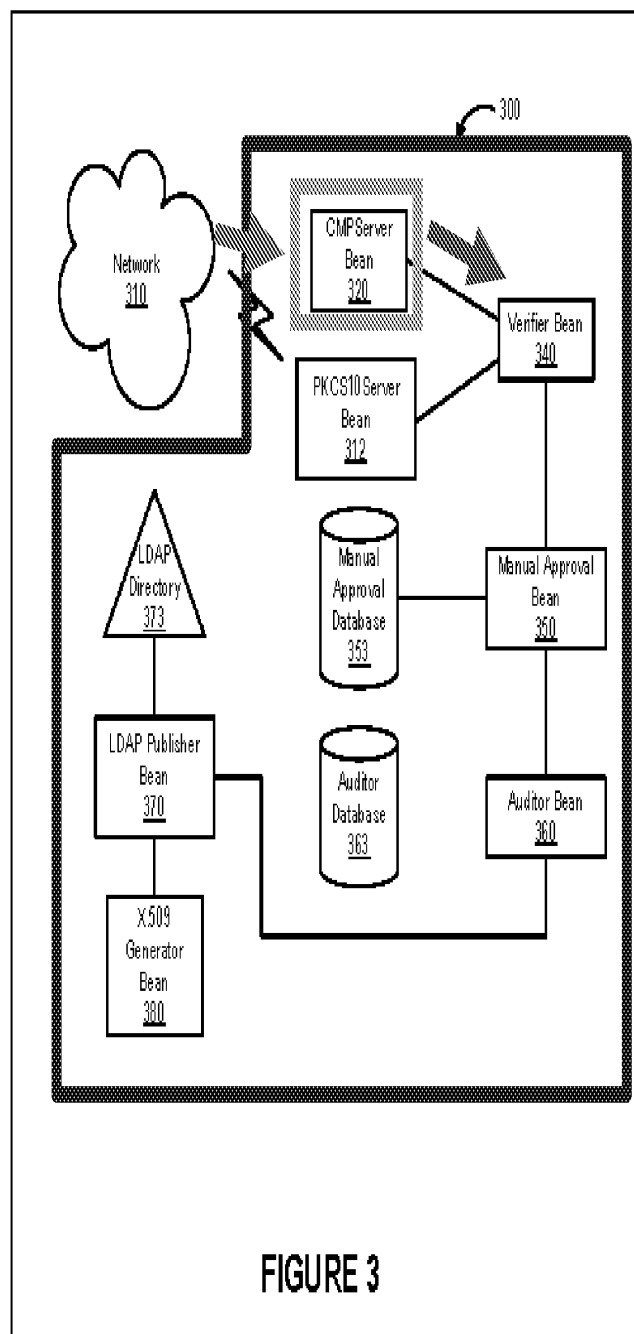


FIGURE 3

24. A computer program product on a computer usable medium, the computer usable medium having a computer usable program embodied therein for implementing a request regarding a digital certificate on a distributed data processing system, the computer usable program including:

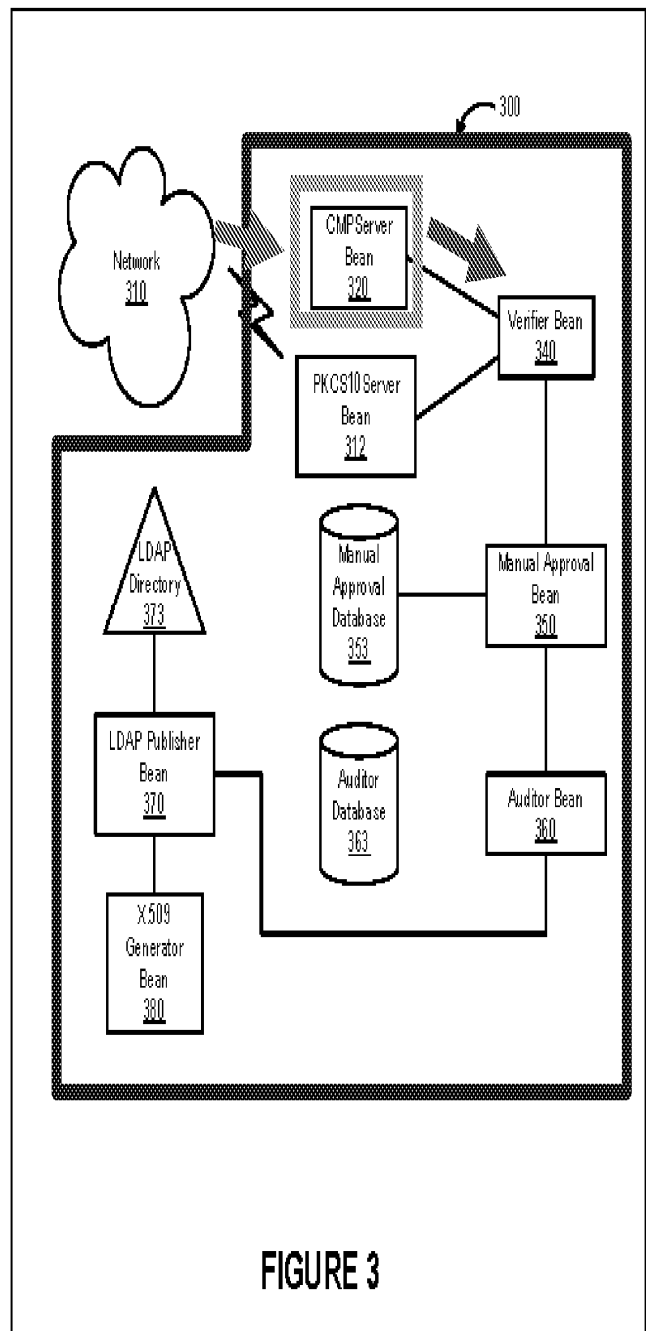
instructions for receiving the request to regarding the digital certificate from the distributed processing system, the instructions for receiving instantiated in an at least one reception bean;

instructions for generating a reception event object in response to the instructions for receiving;

instructions for propagating the reception event object;

instructions for selectively implementing a response to the request regarding the digital certificate in response to a propagated event object, the instructions for selectively implementing instantiated in a request implementation software; and

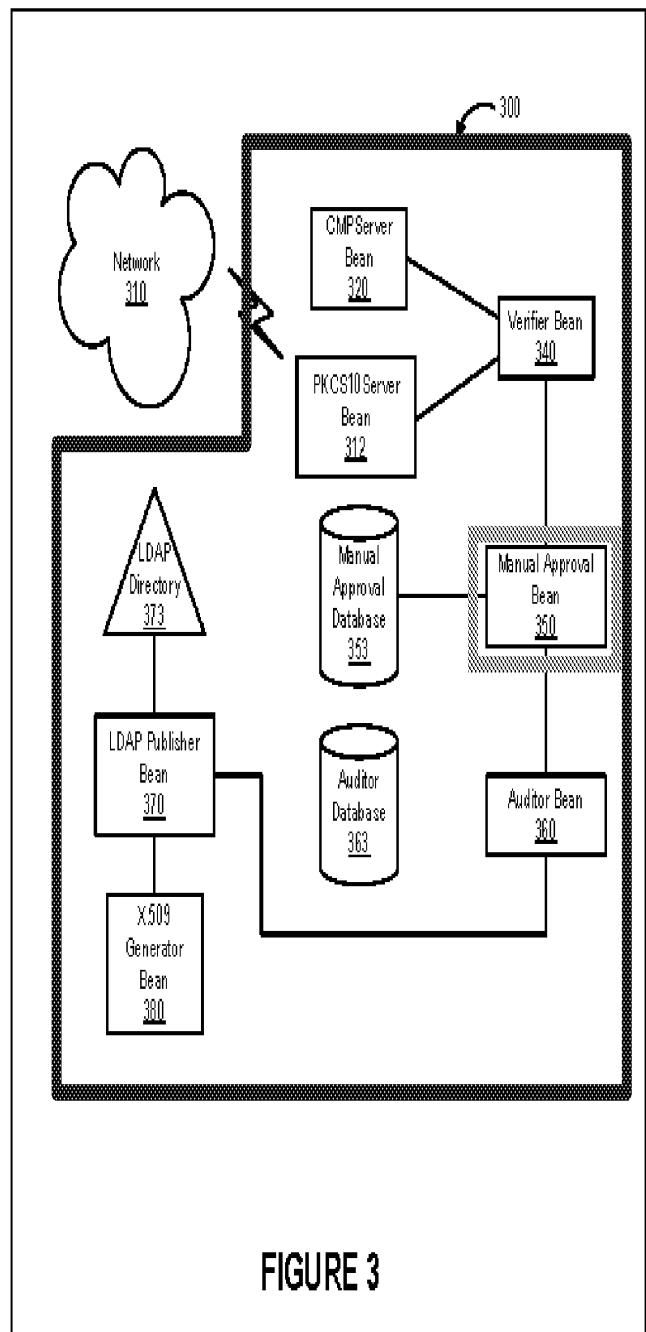
the instructions for receiving the request instantiated in a real time executable object-oriented language.



35. An apparatus for implementing a public key infrastructure in a distributed processing system, the apparatus comprising:

a plurality of beans, the beans communicatively coupled to one another and responsive to events generated by the plurality of beans; and

at least one of the plurality of beans comprising a pipe bean that propagates an event to another of the plurality of beans.



44. An apparatus for implementing a public key infrastructure in a distributed processing system, the apparatus comprising:
a plurality of beans, the beans communicatively coupled to one another and responsive to events generated by the plurality of beans; and
the respective events generated by the plurality of beans subclassing from a base class event.

